

REMARKS

Applicants concurrently file herewith a Petition and fee for a One-month Extension of Time.

Claims 1-19 are all the claims presently pending in the application. Claims 1, 7 and 8 have been amended to clarify the invention and claims 9-19 have been added. Claims 1, 9, and 18 are independent.

These amendments are made only to more particularly point out the invention for the Examiner and not for narrowing the scope of the claims or for any reason related to a statutory requirement for patentability.

Applicants also note that, notwithstanding any claim amendments herein or later during prosecution, Applicants' intent is to encompass equivalents of all claim elements.

Claim 8 stands rejected under 35 U.S.C. § 112, second paragraph as indefinite. Claims 1, 5, and 7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Oshima et al. (JP 07-151, 146) and Bazarnik (U.S. Patent No. 4,612,623). Claims 2, 4 and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Oshima et al. and Bazarnik (U.S. Patent No. 4,612,623), in further view of Nakamura (JP 02-176,218). Claim 3 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Oshima et al. and Bazarnik, in further view of Yokoe (U.S. Patent No. 5,309,075). Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Oshima et al. and Bazarnik, in further view of Yamada et al. (U.S. Patent No. 6,421,630).

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

The claimed invention is directed to a magnetic bearing controller including a processor that controls a magnetic bearing and a counter that accumulates and counts an actual work time of a managed component. The processor also compares the accumulated actual work time with a preset maintenance time.

Conventional magnetic bearing control devices include a digital signal processor (DSP) which control the magnetic bearing and also determine when the bearing has malfunctioned (page 1, line 22 - page 2, line 11). However, the magnetic bearings include components with a relatively short service life and, since there is no accumulation of operation time, maintenance times cannot be anticipated prior to a malfunction of these components.

By contrast, the present invention provides a magnetic bearing controller with a processor that not only controls the magnetic bearing, but also compares the accumulated actual work time with a preset maintenance time. In this manner, the present invention enables maintenance procedures to be anticipated which in turn can reduce down-time and costs associated with that down-time.

Additionally, since the processor performs both the functions of controlling the bearing and performing the comparison, additional components are not required merely for the purpose of performing any comparison.

II. THE 35 U.S.C. § 112, SECOND PARAGRAPH REJECTION

The Examiner alleges that claim 8 is indefinite. Applicants submit, however, that this claim particularly points out and distinctly claims the subject matter regarded as the invention.

Specifically, the Examiner alleges that “said preset limit time” does not have antecedent basis. However, claim 8 depends from claim 2 which clearly recites “a preset limit time.”

The Examiner is respectfully requested to withdraw this rejection.

III. THE PRIOR ART REJECTIONS

A. The Oshima et al. reference in view of the Bazarnik reference

Regarding the rejection of claims 1, 5 and 7, the Examiner alleges that the Bazarnik reference would have been combined with the Oshima et al. reference to form the claimed invention. Applicants submit, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Applicants submit that these references would not have been combined as alleged by the Examiner. Indeed, the references are directed to completely different matters and problems.

Specifically, the Oshima et al. reference is directed to a method for controlling a magnetic bearing. In particular, the Oshima et al. reference is concerned with preventing damage by shutting down the magnetic bearing when the command current exceeds a current limit for a predetermined period of time.

In contrast, the Bazarnik reference is specifically directed to providing a tamper-resistant, running time maintenance monitor which indicates when equipment is due for maintenance. In particular, the Bazarnik reference is concerned with adding a service module 10 onto an existing vehicle such as a fork lift truck (col. 3, lines 12-16). One of ordinary skill

in the art would not have been motivated to modify a control system for a magnetic bearing system based upon the teachings of a maintenance monitor for a vehicle such as a fork lift truck. Thus, the references would not have been combined, absent hindsight.

Even assuming arguendo that one of ordinary skill in the art would have been motivated to combine these references, the combination would not teach or suggest each and every element of the claimed invention. Neither of these references teach or suggest a processor which both controls a magnetic bearing and compares the accumulated actual work time with a preset maintenance time.

As noted above, the claimed invention includes a processor that not only controls the magnetic bearing, but also compares the accumulated actual work time with a preset maintenance time. In this manner, the present invention enables maintenance procedures to be anticipated which in turn can reduce down-time and costs associated with that down-time.

Additionally, since the processor performs both the functions of controlling the bearing and performing the comparison, additional components are not required merely for the purpose of performing any comparison.

In contrast, the Oshima et al. reference discloses a magnetic bearing controller which only serves to compare a command current with an output limit for an amplifier and when that command current exceeds the output limit for a predetermined period of time, the controller shuts down the magnetic bearing. Indeed, as admitted by the Examiner, the Oshima et al. reference does not teach or suggest an accumulated actual work time, let alone a processor which both controls the magnetic bearing controller and compares the accumulated actual work time with a preset maintenance time.

The Bazarnik reference does not remedy the deficiencies of the Oshima et al. reference. Rather, the Bazarnik reference discloses a service module 10 (Fig. 1A) which merely serves to detect and monitor the running time of the equipment based upon the operation of an actuator 14 (i.e. ignition switch) (col. 5, lines 50-58). In other words, the service module 10 does not control any motors or bearings or anything else. Rather, the service module 10 only operates to monitor running time of the equipment on the fork lift. Clearly, the fork lift which incorporates the service module 10 also includes completely separate and independent motor controllers which are not shown but which are obviously connected to the actuator 14 (ignition switch). Therefore, the Bazarnik reference does not remedy the deficiencies of the Oshima et al. reference because the Bazarnik reference does not disclose a controller which not only controls a magnetic bearing, but also compares the accumulated actual work time with a preset maintenance time.

Indeed, if one of ordinary skill in the art would have been motivated to combine the teachings of these references, it is likely that a service module 10 would merely be added to a device as taught by the Bazarnik reference rather than incorporating the functions of the devices together.

The Examiner is respectfully requested to withdraw this rejection of claims 1, 5 and 7.

B. The Oshima et al. reference in view of the Bazarnik reference in further view of the Nakaura reference

Regarding the rejection of claims 2, 4 and 8, the Examiner alleges that the Nakaura reference would have been combined with a combination of the Oshima et al. reference and the Bazarnik reference to form the claimed invention. Applicants submit, however, that these

references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Applicants submit that these references would not have been combined as alleged by the Examiner. Indeed, the references are directed to completely different matters and problems.

As explained above, one of ordinary skill in the art would not have been motivated to combine the Bazarnik reference with the Oshima et al. reference because they are directed to completely different matters and problems. The Oshima et al. reference is directed to a magnetic bearing controller while the Bazarnik reference is directed to a maintenance monitor for a fork lift truck.

Further, in contrast to the Oshima et al. reference and the Bazarnik reference, the Nakaura reference is specifically directed to a magnetic bearing controller which prohibits driving of a motor and a magnetic bearing when a battery is in poor condition. Thus, one of ordinary skill in the art would not have been motivated to modify a maintenance monitor for a fork lift truck with a magnetic bearing controller and the references would not have been combined, absent hindsight.

Further, Applicants submit that the Examiner can point to no motivation or suggestion in the references to urge the combination as alleged by the Examiner. Indeed, the Examiner does not even support the combination by identifying a reason for combining the references.

Even assuming arguendo that one of ordinary skill in the art would have been motivated to combine these references, the combination would not teach or suggest each and every element of the claimed invention.

The Nakaura reference, like the Oshima et al. and Bazarnik reference, does not teach or suggest a controller with a processor that not only controls the magnetic bearing, but also compares the accumulated actual work time with a preset maintenance time.

As noted above, the claimed invention includes a processor that not only controls the magnetic bearing, but also compares the accumulated actual work time with a preset maintenance time. In this manner, the present invention enables maintenance procedures to be anticipated which in turn can reduce down-time and costs associated with that down-time.

Additionally, since the processor performs both the functions of controlling the bearing and performing the comparison additional components are not required merely for the purpose of performing any comparison.

By contrast, the Nakaura reference discloses a magnetic bearing controller which only serves to measure battery voltage prohibit driving when that battery voltage is in a poor condition. Indeed, the Nakaura reference does not teach or suggest an accumulated actual work time, let alone a processor which both controls the magnetic bearing controller and compares the accumulated actual work time with a preset maintenance time.

Clearly, the above combination of novel features are not taught or suggested by the Nakaura reference. Indeed, the Nakaura reference is completely unrelated to the claimed invention.

The Examiner is respectfully requested to withdraw this rejection of claims 2, 4 and 8.

C. The Oshima et al. reference in view of the Bazarnik reference in further view of the Yokoe et al. reference

Regarding the rejection of claim 3, the Examiner alleges that the Yokoe et al. reference would have been combined with a combination of the Oshima et al. reference and

the Bazarnik reference to form the claimed invention. Applicants submit, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Applicants submit that these references would not have been combined as alleged by the Examiner. Indeed, the references are directed to completely different matters and problems.

As explained above, one of ordinary skill in the art would not have been motivated to combine the Bazarnik reference with the Oshima et al. reference because they are directed to completely different matters and problems. The Oshima et al. reference is directed to a magnetic bearing controller while the Bazarnik reference is directed to a maintenance monitor for a fork lift truck.

Further, in contrast to the Oshima et al. reference and the Bazarnik reference, the Yokoe et al. reference is specifically directed to preventing torque variation in a digitally controlled servomotor. Indeed, neither of the Oshima et al. reference and the Bazarnik reference mention anything regarding a servomotor, let alone a digitally controlled servomotor or how a servomotor might be related to a magnetic bearing controller or a maintenance monitor for a fork lift truck. Thus, one of ordinary skill in the art would not have been motivated to modify a maintenance monitor for a fork lift truck or a magnetic bearing controller with a digitally controlled servomotor, and the references would not have been combined, absent hindsight.

Further, Applicant submits that the Examiner can point to no motivation or suggestion in the references to urge the combination as alleged by the Examiner. Indeed, the Examiner does not even support the combination by identifying a reason for combining the references.

Even assuming arguendo that one of ordinary skill in the art would have been motivated to combine these references, the combination would not teach or suggest each and every element of the claimed invention.

The Yokoe et al. reference, like the Oshima et al. and Bazarnik reference, does not teach or suggest a controller with a processor that not only controls the magnetic bearing, but also compares the accumulated actual work time with a preset maintenance time.

As noted above, the claimed invention includes a processor that not only controls the magnetic bearing, but also compares the accumulated actual work time with a preset maintenance time.

By contrast, the Yokoe et al. reference discloses preventing torque variation in a digitally controlled servomotor. Indeed, the Yokoe et al. reference does not teach or suggest an accumulated actual work time or a magnetic bearing controller, let alone a processor which both controls the magnetic bearing controller and compares the accumulated actual work time with a preset maintenance time.

Clearly, the combination of these novel features are not taught or suggested by the Yokoe et al. reference. Indeed, the Yokoe et al. reference is completely unrelated to the claimed invention.

The Examiner is respectfully requested to withdraw this rejection of claim 3.

D. The Oshima et al. reference in view of the Bazarnik reference in further view of the Yamada et al. reference

Regarding the rejection of claim 6, the Examiner alleges that the Yamada et al. reference would have been combined with a combination of the Oshima et al. reference and

the Bazarnik reference to form the claimed invention. Applicants submit, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Applicants submit that these references would not have been combined as alleged by the Examiner. Indeed, the references are directed to completely different matters and problems.

As explained above, one of ordinary skill in the art would not have been motivated to combine the Bazarnik reference with the Oshima et al. reference because they are directed to completely different matters and problems. The Oshima et al. reference is directed to a magnetic bearing controller while the Bazarnik reference is directed to a maintenance monitor for a fork lift truck.

Further, in contrast to the Oshima et al. reference and the Bazarnik reference, the Yamada et al. reference is specifically directed to monitoring a visual display terminal which allows flexible control over a visual display terminal. Specifically, the Yamada et al. reference is directed to addressing the issues experienced by operators suffering from physical problems while monitoring a visual data terminal, such as eye fatigue, stiff shoulders and head aches by implementing a rest state when a preset operation time passes. Indeed, neither of the Oshima et al. reference and the Bazarnik reference mention anything regarding a visual display terminal, let alone a system which enables monitoring of a visual display terminal or how a visual display terminal might be related to a magnetic bearing controller or a maintenance monitor for a fork lift truck. Thus, one of ordinary skill in the art would not have been motivated to modify a maintenance monitor for a fork lift truck or a magnetic bearing controller with anything related to a visual display terminal and the references would not have been combined, absent hindsight.

Further, Applicants submit that the Examiner can point to no motivation or suggestion in the references to urge the combination as alleged by the Examiner. Indeed, the Examiner does not even support the combination by identifying a reason for combining the references.

Even assuming arguendo that one of ordinary skill in the art would have been motivated to combine these references, the combination would not teach or suggest each and every element of the claimed invention.

The Yamada et al. reference, like the Oshima et al. and Bazarnik reference, does not teach or suggest a controller with a processor that not only controls the magnetic bearing but also compares the accumulated actual work time with a preset maintenance time.

As noted above, the claimed invention includes a processor that not only controls the magnetic bearing, but also compares the accumulated actual work time with a preset maintenance time.

By contrast, the Yamada et al. reference discloses addressing the issues experienced by operators suffering from physical problems while monitoring a visual data terminal, such as eye fatigue, stiff shoulders and head aches by implementing a rest state when a preset operation time passes. Indeed, the Yamada et al. reference does not teach or suggest an accumulated actual work time or a magnetic bearing controller, let alone a processor which both controls the magnetic bearing controller and compares the accumulated actual work time with a preset maintenance time.

Clearly, this combination of novel features are not taught or suggested by the Yamada et al. reference. Indeed, the Yamada et al. reference is completely unrelated to the claimed invention.

The Examiner is respectfully requested to withdraw this rejection of claim 6.

IV. FORMAL MATTERS AND CONCLUSION

The Office Action objects to the title. This Amendment amends the title to more clearly indicate the invention to which the claims are directed in accordance with Examiner Tamai's helpful suggestion. Applicants respectfully request withdrawal of this objection.

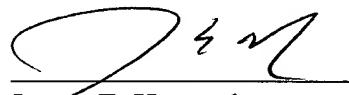
In view of the foregoing amendments and remarks, Applicants respectfully submit that claims 1-19, all the claims presently pending in the Application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the Application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

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